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Progress in the implementation of the programme of action for the sustainable development of small island developing States

Report of the Secretary-General*

Contents

		Paragraphs	Page
I.	Introduction	1	2
II.	Climate change and sea level rise	2–10	2
III.	Management of wastes	11–14	3
IV.	Freshwater resources	15–24	4
V.	Land resources	25–32	5
VI.	Biodiversity resources	33–37	6
VII.	National institutions and administrative capacity	38–45	7
VIII.	Regional institutions and technical cooperation	46–58	8
IX.	Science and technology	59–65	9
X.	Human resource development	66–72	10

* The present report has been prepared by the Department of Economic and Social Affairs of the United Nations Secretariat. It is based on reports on nine programme areas of the Programme of Action, which have been issued as addenda 1-9 to the report. The addenda were prepared in accordance with arrangements agreed to by the Inter-Agency Committee on Sustainable Development, and were the result of consultation and information exchange between United Nations agencies, interested government agencies and a range of other institutions and individuals.

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I. Introduction

1. At its fifth session, in 1997, the Commission on Sustainable Development adopted resolution 5/1, which was endorsed by the General Assembly at its nineteenth special session. In that resolution, the Commission requested its secretariat, with the assistance of the Inter-Agency Committee on Sustainable Development (IACSD) task managers, to prepare reports on all the outstanding chapters of the Programme of Action for the Sustainable Development of Small Island Developing States for consideration at its sixth session, in 1998. The present report and the nine addenda on which it is based (E/CN.17/1998/7/Add.1-9) have been prepared in response to that request. The present report summarizes the major findings and recommendations contained in the addenda. It does not reiterate the basis for action and recommendations contained in the Programme of Action but is meant to supplement the Programme of Action in the light of new findings and experience that have arisen in the course of its implementation. The recommendations for action provided in the present report, if implemented, would give greater effect to those contained in the Programme of Action.

II. Climate change and sea level rise

A. Major additional findings

2. There are varying degrees of national-level efforts within small island developing States. Most small developing islands have ratified the United Nations Framework Convention on Climate Change and are making efforts to comply with its provisions through a series of measures. Some are undertaking studies of greenhouse gas sources and sinks, with assistance from regional and international organizations. Broad strategic directions related to climate change are included in the national strategies for sustainable development of many small island developing States. In some cases, specific policies or strategies for climate change are being developed, with the assistance of regional and international organizations; in others, they are being integrated into coastal management plans. In a number of small island developing States, climate data-collection systems have also become operative. So far, however, little work has been undertaken to develop detailed plans for adaptation to climate change and sea level rise at the national level. Ongoing work to determine vulnerability to climate change and to meet national reporting obligations under the Convention will provide the essential foundation for such plans.

B. Recommendations for action

1. National level

3. Incorporate all considerations, in particular adaptation strategies relating to climate change and sea level rise in long-term development planning processes.

4. Build adequate human resource and institutional capacity to absorb and adapt the findings of the current projects on planning for adaptation to climate change and sea level rise that are currently under implementation in some small island developing States, and take preventive and remedial measures in order to minimize and mitigate the impacts of climate change and sea level rise.

2. Regional level

5. Establish effective institutional capacity for all small island developing States regions to undertake activities related to the modalities of effective and efficient adaptation to climate change and sea level rise. Where such capacity exists, they need to be further strengthened.

6. Implement projects on planning for adaptation to climate change in all small island developing States regions, with the provision to sustain them on a long-term basis, and help to develop the scientific and technical capacity of small island developing States to formulate and implement effective strategies and policies to minimize or mitigate the impacts of climate change and sea level rise. Where such activities have been initiated, they must be sustained.

3. International level

7. Facilitate further research on the regional and temporal responses of sea level rise that takes account, if possible, of changes in the frequency, intensity and location of higher-frequency and smaller-scale phenomena.

8. Facilitate further research on the contributions of ice sheets, glaciers and land and ground water storage to sea level change.

9. Provide adequate financial and technical assistance to help small island developing States to build human-resource and institutional capacity at the national and regional levels to cope with the impacts of climate change and sea level rise, and supplement, as necessary, the resources of the relevant regional small island developing States institutions

responsible for implementing projects on adaptation to climate change and sea level rise.

10. In addition, facilitate the establishment of an observing system for generating data sets to improve model predictions of climate change and to help direct future impacts on small island developing States. Such a system should include (a) a high-accuracy altimeter to measure spatial variations and monitor temporal variability and trends in sea level rise; (b) sufficient (about 30) open-ocean gauges to monitor and eliminate trends in the altimeter; (c) globally distributed set of gauges for sampling at the margin of the altimeter (including coastal regions and high latitudes); (d) geodetic positioning to improve reference levels of *in situ* gauges; (e) improvements in the World Weather Watch Network to address small island developing States meteorological data gaps.

III. Management of wastes

A. Major additional findings

11. To date, there have been no concerted attempts to develop integrated and comprehensive approaches to waste management strategies in most small island developing States. The concept of waste separation and recycling is still in its early stages, though some attempts have been made to reduce the amounts of wastes generated. Many small island developing States have yet to ratify the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal.

12. There are very few sanitary landfills in small island developing States. A large proportion of industrial and hazardous wastes continues to be disposed of in the municipal solid waste stream or even dumped without any control, though this may be prohibited by law. Leakages are quite common. Only a fraction of wastewater is treated before being discharged into the surrounding land and water resources. A lack of technical and financial capabilities to operate and maintain the existing facilities for sewage treatment makes it difficult to control wastewater. Solid and liquid wastes generated from ships and the resulting pollution are of considerable concern to small island developing States, but no perceptible progress has been made in building port reception facilities for accepting ship-borne wastes or for avoiding oil spills in ports. A few international and regional initiatives have been taken, but much remains to be done for the protection of the marine environment and for development.

13. Suitable financial planning for the entire cycle of waste management has not been well developed in most small island developing States, resulting in severely underfunded operations and a shortage of proper facilities and trained operators. One of the most disturbing aspects is the lack of financial autonomy of waste management institutions. Where waste management departments are self-financing, the revenue generated is often used for other purposes. Tools for mobilizing financial resources, such as government budgetary allocations, charge systems and other relevant economic instruments, have yet to be developed and included as core elements of financial strategies.

B. Recommendations for action

14. Further efforts are needed at all levels to implement the actions, policies and measures identified in the Programme of Action. Higher priority should be given to the economic and financial aspects of waste management. Revenue-generating policies for improving the financing of waste-management facilities should be seriously considered by regional and local governments in small island developing States. Specific priority actions which could give effect to the objectives of the Programme of Action at the national and regional levels could include:

(a) Improve landfill management, including by selecting optimal technologies and financial mechanisms, such as landfill charges and other levies. The management plan should also encompass operational requirements with appropriate guidelines/standards, including capacity-building, regular monitoring and measures to be taken in the closure of landfills;

(b) Separate industrial wastes, particularly hazardous wastes, from domestic waste and dispose of them properly. Inventories of industrial waste, pollutants and hazardous waste and code of practice need to be introduced for environmentally sound industrial operations in small island developing States, modified as appropriate for local use, in close cooperation with regional and international bodies;

(c) Secure suitable long-term storage facilities for hazardous waste and identify suitable final disposal options;

(d) Where they have been introduced, efforts are needed to improve the efficiency of septic tank systems. Sound practices leading to the incorporation of septic sludge into local agricultural and forestry operations should be developed and disseminated;

(e) Environmental impact assessments should be made mandatory for all projects related to waste disposal.

IV. Freshwater resources

A. Major additional findings

15. Small islands have limited options when developing their freshwater resources. The relatively short length of freshwater circulation in small islands limits the methods available to utilize them. To maintain surface and groundwater circulation requires regular recharge events. The geophysical settings of many small island developing States make them vulnerable not only to extreme climatological and seismic events, but more critically to unpredictable periods of low recharge. On volcanic piles with rapid baseflow recession and on atoll islands with thin freshwater lenses, hydro-environmental limits in terms of water quantity and quality are reached very quickly in periods of low recharge. Moreover, many small island developing States have few or no permanent streams or lakes. They have limited capacity to store water for use during the dry season. Building large reservoirs in small island developing States can flood large areas of their relatively scarce land area. Furthermore, steep topography, short river channels and easily erodible soils can cause siltation of reservoirs, further decreasing their capacity for water storage.

16. As a result, many small island developing States depend heavily on groundwater resources, which often exist in the form of freshwater "lenses" that contain limited quantities of water. Water withdrawals at rates that exceed sustainable replenishment can result in saline intrusion, thereby damaging or destroying freshwater lenses. Sea-water intrusion into small island developing States groundwater resources is obviously a serious problem, given that they are surrounded on all sides by marine water. The relative fragility of the hydrological cycles in small island developing States necessitates careful planning and development of freshwater resources in order to work within these hydro-environmental limits.

17. The water quality problem in small island developing States is aggravated by the disposal of partially treated or untreated domestic and industrial effluents into the sea. Indiscriminate disposal into near-shore environments with poor flushing to the open sea has reduced coastal water quality, particularly near large coastal settlements. As chemical and organic pollutants become more pervasive, the impact on marine environments is becoming evident, and long-term accumulation of pollutants in marine ecosystems is threatening biodiversity and local fishing industries. Pollution of marine resources from land-based activities is also a critical issue for small island developing States because they are frequently subject to torrential rains. Combined with steep topography and short river channels, this results in storm-generated run-off, including industrial wastes, mining drainage and domestic wastes, into surrounding coastal waters.

18. High water consumption by tourists and consequent production of wastewater, particularly in coastal settings, poses problems for liquid and solid waste disposal in coastal aquifers or atoll freshwater lenses. Indeed, the marketing of small island developing States as "sun, sea and sand" paradises has resulted in many hotels being built on or near beach areas, thereby concentrating waste-producing establishments near coastal waters.

B. Recommendations for action

19. Small island developing States need an integrated approach to strengthening institutions, including ministries and departments that can fundamentally affect their environmentally sustainable management and use of water resources. Cross-sectoral collaboration between land and water planning should be actively promoted, and the effectiveness of environmental agencies to monitor and enforce good spatial planning practices in fragile upland and coastal zones needs to be enhanced. The diminutive size of small islands means that sustainable socio-economic development and the needed natural resource base, including water resources, are interdependent. Thus, management and use of freshwater, coastal and marine resources should be undertaken within an institutional framework that considers linkages with the sources of potential impacts on those resources.

20. Small island developing States often need island-specific or regional studies to identify and assess their water resources, and to implement effective development and management programmes. To that end, some regions have organizations so that small island developing States can share their technical expertise and experience with each other. Establishment of relevant institutions, where needed, is one means of facilitating such exchange. One existing example is the Pacific Water and Waste Association. It would also be helpful to encourage linkages between small island developing States and bigger archipelagic countries, such as Indonesia, Malaysia and the Philippines, which have development programmes for their island provinces.

21. Efficient management and use of appropriate technologies can conserve and protect limited water resources. Further efforts are required to implement policies

for promoting efficient water services and the efficient use of and protection of available water resources. As an illustrative example, Maldives has made it mandatory for all new houses to have rainwater harvesting facilities. Demand management and leak detection can help to conserve the existing resource base. Proactive programmes of waste management and waste minimization can help to protect the resource base, but they also need to be linked to land management policies if they are to be effective.

22. Technologies more appropriate for small island developing States, such as rainwater harvesting, infiltration galleries to skim freshwater lenses and the use of low yielding solar pumps, need to be promoted to avoid last resort solutions, such as desalination.

23. The further identification and application of cleaner production methodologies that are suited to the specific development and resource needs of small island developing States should also be priority activities. These should include cleaner practices and technologies for the efficient use of water resources in all industries, particularly hotels and tourism facilities.

24. The unique characteristics of small island developing States call for urgent efforts to develop (a) self-sufficient facilities to handle solid waste, sewage and wastewater, and (b) facilities for the prevention of groundwater contamination.

V. Land resources

A. Major additional findings

25. Land pressures in some small island developing States have been further worsened by the intensification of animal farming, particularly high-input production chains. The persistence of unsustainable agricultural practices continues to contribute to deforestation in several small island developing States. A number of small island developing States are affected by changes in cropping patterns, with consequent losses of biodiversity across the landscape, loss of soil fertility, and agrochemical pollution of soils, freshwater and coastal resources downstream. Furthermore, land tenure policy in some small island developing States and other policy issues in all of them critically affect land management, as do a multiplicity of socio-economic factors, such as trade and the influence of outside markets, traditional and cultural practices, and demographics. Small island developing States rarely have an extensive and stable cadre of professional expertise, so that there is a lack of information on land resources, appropriate tools, best practices and technologies for implementing sustainable land use options and for making informed policy decisions.

B. Recommendations for action

1. National level

26. Critical efforts to better address land resources include the need to better understand land use objectives, land use options and trade-offs between uses, the need for institutional collaboration and coordination of ministries, the need to implement land dispute resolution systems and the need to use technologies as a basis for land use decision-making.

27. Institutionally, there is a need to take an intersectoral approach to addressing the complex issues of land resources wherever that is not already being done, which will entail the adoption of an integrated planning process with enhanced collaboration on the part of the Government and all relevant non-governmental stakeholders so as to make the best use of the comparative advantage of each.

28. Numerous tools, approaches, techniques and guidelines have been developed by relevant United Nations and non-United Nations organizations that small island developing States can take advantage of to address issues of land resources. A number of those modalities are currently being utilized or tried in individual small island developing States. There is a need, however, for training in the use and institutionalization of such tools, approaches and guidelines in all small island developing States.

29. Natural resource conservation should be strongly promoted by rehabilitating traditional attitudes and value systems, and by making people aware of the finite and fragile nature of those resources in today's conditions, particularly in small island developing States.

2. Regional level

30. Mechanisms must be put in place to enhance the communication networks that have been developed, as well as to develop those that are still needed. Recognizing the complexity and diversity of the natural resource management task, and the difficulty and financial burden associated with the provision of the required multidisciplinary teams of professionals in each country, the establishment of an appropriate regional mechanism within one of the existing regional organizations might be considered. Such a mechanism would provide resource management services to small island Governments, make available skills and

experience that would be much more difficult to build at national level, and facilitate the transfer and sharing of technical information and research results.

31. Effective coordination of measures designed to foster an integrated approach to the planning and management of land resources by regional institutions, including universities and relevant international programmes or initiatives, should be encouraged in all small island developing States regions where such measures have not yet been taken.

3. International level

32. International agencies and organizations must better coordinate their efforts in assistance to small island developing States; assist in the strengthening and support of regional networks; facilitate the adoption and implementation of appropriate integrated planning processes for natural resources as a means of ensuring their sustainable use; provide technical assistance in support of information systems for effective decision-making regarding land resources, as well as to assess and revise national legislation, if needed; implement appropriate training programmes; and facilitate the application of databases in integrated land use planning and management.

VI. Biodiversity resources

A. Major additional findings

33. The biodiversity of small island developing States continues to be seriously threatened by a combination of natural and anthropogenic factors. Effective conservation and sustainable use of small island developing States biodiversity entails the sustainable management of genetic resources for food and agriculture, forestry, fisheries and aquaculture, which may call for a "farming" systems approach. For forestry and capture fisheries, it implies adopting an environmentally sound and socially beneficial management approach, integrated with other land and water management strategies. Community-based management systems and related land and fishing rights in supporting food production systems are important as a basis for applying this approach. Urgent implementation of relevant regional and international agreements is particularly important for the sustainability of the fishery resources that migrate through or straddle areas of the natural jurisdiction of small island developing States.

34. To curb rapid loss of biodiversity, deforestation caused by agricultural expansion and overharvesting of forests must be controlled to reverse the continuing serious environmental consequences of lost tree cover and downstream impacts on marine areas. For sustainable forest use, the remaining forest areas of most small island developing States require immediate attention, including possible reorganization of the entire logging industry sector. Deforestation must be minimized through a coordinated policy for effective use and conservation of the remaining forest resources. In erosion-prone areas, farmers must be encouraged to adopt appropriate agro-forestry practices, which also should become an established component of integrated rural development.

B. Recommendations for action

1. National level

35. Further efforts are needed at all levels to implement the actions, policies and measures identified in the Programme of Action. Moreover, additional measures are also needed to:

(a) Build national technological and human capacity for managing natural resources, and upgrade national capabilities for marine and terrestrial resource surveys, by training key personnel and implementing measures to retain their services within the public sector;

(b) Introduce charges for using sea lanes and straits to internalize part of the costs of small island developing States biodiversity losses arising from inappropriate practices, such as waste discharges, incineration or accidental spills in proximate national or international waters. Charges and taxes on enterprises for discharges of inadequately treated wastes, taking into account the potential biodiversity losses resulting from such practices, could also be considered;

(c) Strengthen national capabilities to maintain agro-biodiversity, including animal and plant protection and quarantine services through assessment and strengthening of national legislation, facilities and services, including surveillance;

(d) Enhance farming systems and improve management of natural resources, as applicable, rehabilitate degraded habitats, where appropriate, and monitor the impact of development programmes, including the impact of introduced species on native ecosystems, and the success of rehabilitation efforts;

(e) Evaluate and modify – if necessary – and implement existing guidelines and codes of practice on best practices in farming systems and species introduction.

2. Regional level

36. Measures are also needed to:

(a) Strengthen regional activities for harmonizing legislation and promoting the exchange of technologies and expertise;

(b) Strengthen the capacity of regional bodies to undertake surveys on reef, estuary, wetland and lagoon resources, and monitor and promote innovative coral reef and mangrove programmes.

3. International level

37. Measures are also needed to:

(a) Assist small island developing States in developing inventories of marine biodiversity resources and in strengthening regional and marine research centres;

(b) Support participation of small island developing States representatives in relevant global negotiation processes, including in meetings of the Convention on Biological Diversity, especially the Conference of Parties to the Convention and its Subsidiary Body on Scientific, Technical and Technological Affairs, and in expert and liaison groups, to ensure appropriate consideration of small island developing States priorities;

(c) Support small island developing States in strengthening national and regional capabilities for conservation and the sustainable use of genetic resources for food and agriculture, including the implementation of priorities identified in the Global Plan of Action for Plant Genetic Resources adopted at Leipzig in 1996;

(d) Provide technical assistance to assess and revise, where needed, national legislation, implement appropriate training, and enhance database development and technology transfer. Countries that import small island developing States animal and plant resources should be encouraged to assist small island developing States in upgrading their facilities and strengthening animal and plant protection and quarantine services to ensure the achievement of international standards.

VII. National institutions and administrative capacity

A. Major additional findings

38. Most small island developing States Governments have taken important initiatives to strengthen national institutions and administrative capacity. Many of them have established high-level bodies charged with the overall responsibility for guiding and coordinating national policies and measures for integrating environmental protection and development. New legislation has been adopted to provide a sound and updated legal framework for the pursuit of sustainable development. In a number of small island developing States, comprehensive national strategies have been formulated to provide blueprints for long-term coordinated action. There has also been a growing trend of public participation.

39. There is, however, a continuing need for strong action in this area because small island developing States remain constrained by limited financial, human and technical resources. Some have very limited capacity, even for handling inter-agency coordination. Planning to enforce new legislation and to implement sustainable development measures and implementation of sustainable development policies and measures remain uncoordinated, and are invariably fragmented. There is much room for improving inter-ministerial coordination at the national level and more effective cooperation at the regional level.

B. Recommendations for action

1. National level

40. Small island developing States Governments should further strengthen their national sustainable development bodies by enhancing their political and legal status, increasing their staffing levels and improving their modalities of operation. Those that have not established such a body should take immediate action to ensure that a national mechanism for guiding and coordinating sustainable development policy be put in place and given adequate status and resources for effective functioning.

41. Although many small island developing States have adopted new legislation and formulated national strategies, they need to ensure that the new laws are enforced and strategies are implemented. Particular attention should be paid to the training of civil servants to adequate levels in order to enable them to effectively implement reformed legislation and revised development strategies.

2. Regional level

42. Small island developing States Governments should both expand and deepen their regional and subregional cooperation in national institutions and administrative capacity-building, especially in areas where they are lacking in expertise and where joint activities in research and training could help to overcome national resource constraints, facilitate the exchange of national experience and increase the cost-effectiveness of regional cooperation.

43. Regional institutions should be given adequate resources to provide research and training opportunities, undertake critical assessments of priorities and needs, and facilitate the exchange of experience and the dissemination of information. Regional institutions that have the appropriate expertise should assist small island developing States in the preparation of new legislation, as necessary, and in the formulation and implementation of national strategies.

3. International level

44. The international community should provide adequate financial resources to small island developing States so as to enable them to carry out necessary institutional reforms and changes, and to improve their national administrative capacity. The United Nations agencies should increase training activities to help to update and improve the skills of staff engaged in sustainable development activities. Organizations with the appropriate technical capacity, including United Nations funds and programmes and specialized agencies, should also provide technical assistance or advisory services to small island developing States in building up their national institutions.

45. Bilateral donors should provide financial and technical support to small island developing States to facilitate their ratification and implementation of relevant international instruments; help to provide training opportunities and facilities, including scholarships, particularly in areas where small island developing States suffer from serious lack of local expertise; and support current efforts to build an information network for small island developing States so that they may have better access to information on state-of-the-art technology, and become active participants in the exchange of experience and the dissemination of information.

VIII. Regional institutions and technical cooperation

A. Major additional findings

46. Governments of small island developing States in the Pacific and the Caribbean have put in place a number of regional and subregional intergovernmental institutions, with mandates ranging from specific areas of the Programme of Action to the entire Programme of Action. In recent years, they have also demonstrated their commitment to regional institutions through increased financial support for some of them.

47. Regional institutions have taken a keen interest in the implementation of the Programme of Action. In the recent past, regional institutions in the Pacific and some in the Caribbean have also taken measures to enhance their own effectiveness and efficiency through greater inter-institutional coordination and the avoidance of duplication of activities.

48. However, regional and subregional institutions have faced a number of constraints that tend to undermine their effectiveness. The major constraints are related to insufficiency of financial and human resources to carry out core programmes. They are also hampered by the lack of firmly established regional coordination mechanisms, particularly in the Caribbean and the African regions, as well as the inadequacy of integration of environmental dimensions in the socio-economic planning process at the national level, which makes it difficult to identify priorities for the development of coherent regional and subregional programmes.

B. Recommendations for action

1. National level

49. To strengthen regional cooperation, it will be necessary for small island developing States to explicitly integrate environmental dimensions in the long-term policy planning process at the national level and to identify priority areas for regional implementation in order to enable the development of coherent regional and subregional programmes.

50. In the recent past, small island developing States that are member States of some regional institutions have increased their financial support for the running of such institutions. Such support needs to be further strengthened

so as to make it commensurate with the needs of all regional and subregional institutions in order to raise their effectiveness.

51. In some small island developing States regions, there is a need for greater political commitment to the implementation of regional programmes.

2. Regional level

52. Efforts to strengthen coordination among regional and subregional institutions have begun in the Pacific. Such efforts are needed in all small island developing States regions. For effective coordination of the implementation of the Programme of Action, there is a need to establish permanent regional coordination mechanisms and to provide them with resources commensurate with their needs.

53. Regional institutions need to make efforts to strengthen their own technical capacity in order to meet technical assistance needs of member States.

54. Regional and subregional institutions need to work more closely with national Governments to identify programmes and projects for the development of realistic regional and subregional programmes in the short and medium terms.

3. International level

55. In view of the obvious benefits to be derived from regional cooperation, the international community needs to adequately supplement the financial resources provided by member States for the support of regional institutions.

56. In order to enable regional institutions to effectively meet the technical assistance needs of member States, there is a need for the international community to assist regional institutions in building their technical capacity to levels that are commensurate with the needs of member States.

57. Although the prime responsibility for the execution of regional programmes and projects rests with small island developing States Governments, in view of the meagre resources of individual small island developing States and the high costs of regional programmes, there is an obvious need for adequate financial support from the international community for timely and effective implementation of regional programmes.

58. Relevant United Nations regional commissions and other United Nations organizations need to demonstrate a greater level of engagement in the implementation of the Programme of Action, particularly in the African region.

IX. Science and technology

A. Major additional findings

59. In spite of considerable efforts by several of them, most small island developing States lack a critical mass of qualified scientists and associated institutions. Current reward systems in island countries do not encourage long-term careers in science, and the availability of funds for training and research in specialized fields of science is limited. Brain drain adds to the scarcity of skills and expertise in relation to the advance of science in small island developing States. This is evident in the high proportion of expatriate personnel in island institutions, and in aid programmes heavily weighted towards technical assistance.

60. Most small island developing States do not possess economies of a sufficient scale to allow for a national scientific infrastructure of the scope required to address many national needs. One solution to this problem is for countries to cooperate at subregional or regional levels to share institutions of higher learning and advanced research and development facilities. Pooling the resources of countries with similar problems, agreeing on common programmes and building synergies are evidently more cost-effective than developing national institutions. Given the serious lack of resources and qualified personnel in small island developing States, a realistic short-to-medium-term strategy for building scientific and technological capacity to manage the effective transition to sustainable development would be to concentrate on subregional measures, wherever feasible. Subregions usually tend to share several common characteristics that facilitate a more rational and efficient use of resources, including qualified staff. Subregional efforts also have greater potential for creating local capacity in the short to medium term than regional (continental) and international programmes. Frequent contacts between scientists from small island developing States and industrialized and relatively advanced developing countries would serve as an efficient modality for rapidly disseminating and applying new scientific and technological methods. At relatively low cost, much can be achieved in practical terms through funds for scientific visits and meetings, electronic communication, access to data banks and so on.

B. Recommendations for action: science

1. National level

61. Intensive and appropriate use of science and technology in small island developing States is essential for attaining sustainable development goals. Governments of small island developing States are encouraged to:

(a) Make greater efforts to improve science education in all phases of formal and informal education;

(b) Establish a network of scientists to work in schools and the public and private sectors;

(c) Undertake national or regional assessments of needs for the capacity in science;

(d) Promote strong linkages between universities and research institutions, on the one hand, and national industries, agriculture and other economic sectors on the other hand, so that scientific knowledge and information finds its way into the productive sectors, and make every effort to induce the private sector of national economies to invest more in the development of science;

(e) Take steps to record and apply indigenous knowledge in promoting participatory approaches to natural resources management and to the equitable and sustainable use of resources.

2. Regional and international levels

62. Relevant regional organizations and international organizations, with donor assistance, could collaborate in assisting small island developing States in:

(a) Implementing programmes to improve the teaching of basic science within the context of the local environment and culture. In Pacific small island developing States, use could be made of the regional Science Education for Pacific Schools programme;

(b) Better educating current and future leaders of civil society on key scientific issues affecting a sustainable future, through schools, youth work and community awareness activities.

C. Recommendations for action: technology

1. National level

63. The Governments of small island developing States are encouraged to:

(a) Provide incentives to venture capital and explore other modalities for meeting the required financing needs of environmentally sound technology firms;

(b) Provide fiscal and other policy incentives to encourage domestic and foreign investment in the industrial sector, and consider special incentives for environmentally sound technology-related investments.

2. Regional level

64. At the regional level, it is necessary to:

(a) Promote the establishment of appropriate regional institutions for the collection and synthesis of data and information on innovative industrial technologies for the sustainable development of small island developing States and on the impacts of industrial innovation on their economies, including their marine and coastal systems;

(b) Develop regional mechanisms to further promote ventures for financing new technology-based firms;

(c) Assist small island developing States with very small populations in (I) better applying science and technology to sustainable development at the community level through participatory projects, (ii) sharing information on best practices and successful methods.

3. International level

65. The international community is urged to:

(a) Enhance international cooperation in the development and promotion of technological innovations relevant for small island developing States as components of international or regional investment projects;

(b) Provide improved access to financial and technical resources to assist small island developing States in establishing regional centres for capacity-building, including training in the management of innovative technologies, technology negotiations and transfer.

X. Human resource development

A. Major additional findings

66. Small island developing States Governments, regional organizations and the United Nations system have accorded priority to this area, as reflected in the initiatives by small island developing States and support action by both regional organizations and the United Nations system. However, the unique demographic, economic and geographic constraints

faced by small island developing States call for a strengthening of the concerted efforts at human resource development. The recent declines in external resources allocated to human resource development in small island developing States are a cause of grave concern.

67. Policy initiatives by some small island developing States Governments in the areas of institution-building, educational reform, training and regional cooperation in environmental management provide useful experiences, and should be shared with others in their efforts to formulate and implement human resource development strategies.

B. Recommendations for action

68. It is strongly recommended that small island developing States Governments continue to accord priority to human resource development in all its dimensions – human health care, basic education, environmental education, training and resource management in specific fields.

69. Given demographic, economic and geographic constraints, small island developing States should consider a well educated, highly adaptable and environmentally conscious population and workforce to be a central pillar of national sustainable development. Small island developing States Governments should create conditions, including through regional mechanisms, to retain newly acquired or updated endogenous expertise.

70. Small island developing States should further strengthen regional cooperation through pooling of resources and expertise, increase the effectiveness of such cooperation through systematic identification of needs and planning of projects, and increase the efficiency of regional resource use through better coordination.

71. Regional organizations and the United Nations system should strengthen their support to small island developing States. In particular, the organizations and bodies of the United Nations system should increase their operational activities to provide training and expertise to small island developing States in integrated resource management. Areas where local capacity is relatively insignificant should be accorded priority in funding and provision of technical assistance.

72. The declines in external resources provided to small island developing States for human resource development should be reversed as a matter of urgency. In this regard, the envisaged meeting between representatives of small island developing States and bilateral and multilateral donors provides a great opportunity for taking concrete actions.